

DS ASSIGNMENT NO: 03

Load Balancing

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CODE

```
#include <iostream>
using namespace std;
int main() {
    int servers;
    cout << "Enter number of servers: ";
    cin >> servers;

    int req;
    cout << "Enter number of requests: ";
    cin >> req;

    // Dynamically allocate an array on the heap exactly the size we need.
    // This avoids a fixed limit.
    int* request_ids = new int[req];

    // Input request IDs
    for (int i = 0; i < req; i++) {
        cout << "Enter request ID (or client IP as number): ";
        cin >> request_ids[i];
    }

    // Output load distribution
    cout << "\n=== Load Balancing Results ===\n";
    for (int k = 0; k < servers; k++) {
        cout << "Server " << k << " handles requests: ";

        bool assigned_request = false;
        for (int j = 0; j < req; j++) {
            if (request_ids[j] % servers == k) {
                cout << request_ids[j] << " ";
                assigned_request = true;
            }
        }
    }
}
```

```

    }
}

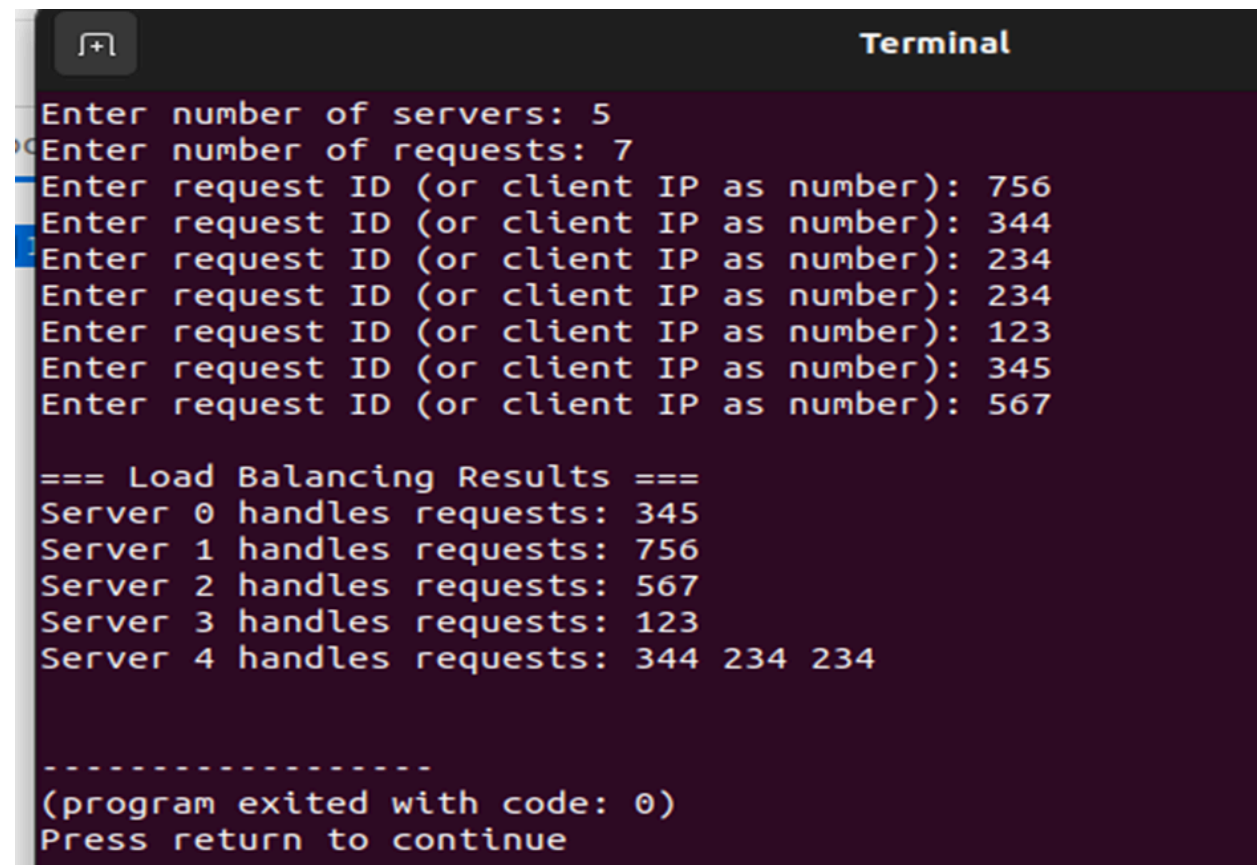
if (!assigned_request) {
    cout << "None";
}
cout << endl;
}

// Free the dynamically allocated memory to prevent memory leaks
delete[] request_ids;

return 0;
}

```

OUTPUT



A terminal window titled "Terminal" with a dark background and light-colored text. The output shows the user entering 5 servers and 7 requests. The requests are: 756, 344, 234, 234, 123, 345, and 567. The program then displays the load balancing results for 5 servers. Server 0 handles 345 requests, Server 1 handles 756, Server 2 handles 567, Server 3 handles 123, and Server 4 handles 344, 234, and 234. The program exits with code 0.

```

Terminal
Enter number of servers: 5
Enter number of requests: 7
Enter request ID (or client IP as number): 756
Enter request ID (or client IP as number): 344
Enter request ID (or client IP as number): 234
Enter request ID (or client IP as number): 234
Enter request ID (or client IP as number): 123
Enter request ID (or client IP as number): 345
Enter request ID (or client IP as number): 567

=== Load Balancing Results ===
Server 0 handles requests: 345
Server 1 handles requests: 756
Server 2 handles requests: 567
Server 3 handles requests: 123
Server 4 handles requests: 344 234 234

-----
(program exited with code: 0)
Press return to continue

```